Brady RFID External Programming Module

Users Guide

Preliminary

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Important Information

Limited Hardware Warranty

Brady Worldwide, Inc. warrants solely to the purchaser that the hardware components of the External Programming Module will be free from defects in materials and workmanship under normal use for a period of 90 days from the date of shipment by Brady Worldwide. This limited warranty does not extend to any components which have been subject to misuse, neglect, accident, or improper installation or application. Brady Worldwide's liability to the purchaser's remedy for the breach of this warranty shall be at Brady Worldwide's option to either (i) repair or replace defective components or (ii) upon return of the defective components, refund the purchase price paid for the components. *EXCEPT FOR THE LIMITED HARDWARE WARRANTY SET FORTH ABOVE, BRADY WORLDWIDE AND ITS LICENSORS PROVIDE THE HARDWARE ON AN "AS IS" BASIS, AND WITHOUT WARRANTY OF ANY KIND EITHER EXPRESS, IMPLIED, OR STATUTORY.*

Limitation of Liability

In no event shall Brady Worldwide or its suppliers be liable for any damages in excess of the price paid by the end user to Brady Worldwide for the components, regardless of under what legal theory such damages may be alleged arising out of the use or inability to use the component, even if Brady Worldwide has been advised of the possibility of such damages.

FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following condition: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may

cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

FCC ID
NUC-BEPM10

Specifications

Input Voltage . . . . +12V DC Nominal
Input Current
       While Activated . . . . 150 mA
       Standby . . . .   20 mA

Frequency of Operation . . . . ASK (Amplitude Shift Keying)

Temperature
       Operating . . . . +5º to 40º C (41º to 104º F)
                          20% to 85% non-condensing R.H.
       Storage . . . . -40º to 60º C (-40º to 140º F)
                          20% to 85% non-condensing R.H.

RS-232 Communications . . . . 19.2kb, 8 data, 1 stop, No parity

Host Software OS . . . . Win95/98 ™, WinNT ™

Product Description

Background Information

RFID Smart Labels are an alternative to traditional RFID cards and tags. The labels operate at a higher frequency which allows the physical construction to be thinner, more flexible, and lower cost. With the advent of converted labels that have RFID functionality included in them, there is a need to image and encode the label with a seemless system.

Brady has altered its label creation software to include RFID encoding functionality along with the standard printing capabilities. Brady has also designed an encoding device (External Programming Module) that is used with this software to image and encode RFID Smart Labels. The external approach of programming RFID Smart Labels allows for programming various sized labels on any existing thermal transfer printer. The external approach also verifies that the RFID functionality of the label to verify that it was not damaged in the printing process by high head pressure or extreme angles.

Brady also sells readers that provide for various read ranges and applications. The development of an end user application with the readers can be achieved by using the host software routines written by Brady in conjunction with various compilers. The routines allow developers to quickly develop programs that exploit full functionality of the readers and the RFID Smart Labels.

To compliment these products, Brady also sells the RFID Smart Labels. Brady offers the labels in various sizes, various materials, and various protocols. Standard labels can also be customized to meet a customers needs if desired. Brady also sells patented RFID Smart Labels with a protective layer inside the label to protect the RF integrated chip by distributing the head pressure across that layer.

The combination of the patented label, label creation software, and the external programming along with Bride's traditional application and integration support will bring the full RFID solution to hand. To learn more about anything on this page, see the PDF's included on the CD-ROM.

Components Included
Upon Receipt, check the package contents for the items listed below.
After checking, fill out and return product registration card.

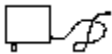|		
	External Programming Module (EPM)	Encodes RFID Smart Labels after the labels are imaged by a thermal transfer printer.
	Mounting base, foam spacers, and feet.	Provides rigid base for the EPM for use with a thermal transfer printer. The foam spacers are for use with different printers.
	Post, bolt, adjustment knob, and screws.	Post for the EPM that is mounted to mounting base with screws. The EPM is mounted on the post and is adjustable with the bolt and adjustment knob.
	12 Vdc Power Adapter	Provides power to the external programming module.
	RS-232 cable	Connects the EPM to a host computer
	Software on CD-ROM	Used to install EPM host library functions on host computer. Included is also all available product documentation in PDF form.
	Users Guide	(This manual.) Explains how to install and properly use the EPM for encoding RFID Smart Labels
	Registration card	Registers your product for support, warranty, and future information.

External Programming Module (EM)
The EMP is used with a thermal transfer printer to encode the RFID Smart Labels. The EPM is placed adjacent to the exit of the printer so labels pass over the EPM and can be encoded after printing. The EPM has three indicators to indicate the status of operation. When the EPM is setup and used correctly, it can encode a wide variety of labels.

Mounting Base
The mounting base provides a rigid base for the EPM for use with a thermal transfer printer. The base is placed under the printer and held in place by foam spacers and rubber feet. The physical construction of the base allows for little movement of the EPM, which is important due to possible alignment issue during encoding.

Post
The post is connected to the mounting base via screws providing a rigid post eliminating the possibility of alignment issues again. The post supports the EPM via a bolt and an adjustment knob. The bolt and adjustment knob together in the post provide the capability of adjusting the height of the EPM above the base for use with a variety of printers. The construction of the EPM and use of the adjustment knob also allows for the ability to swing the EPM out of the way to gain access to the printed labels and/or printer.
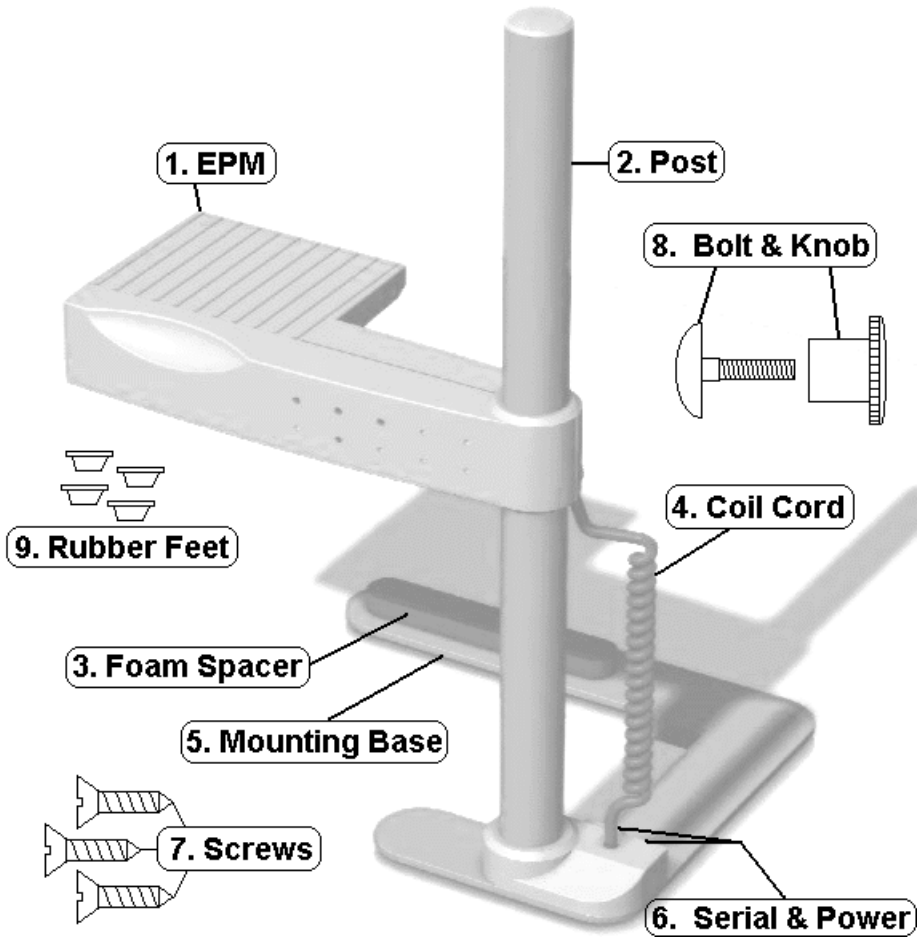
12 Vdc adapter
The adapter provides the EPM with 12 volts DC for proper operation. The output of the adapter plugs into the connector located on the mounting base. The power is then supplied to the EPM via the coiled cable.

Serial cable
The serial cable provides a communication channel between the host and the EPM. The serial cable is connected to the connector located on the mounting base. The signals are then routed (along with power) to the EPM via the coil cable.

Basic Assembly

1. EPM
2. Post
8. Bolt & Knob
4. Coil Cord
9. Rubber Feet
3. Foam Spacer
5. Mounting Base
7. Screws
6. Serial & Power

1. Insert the bolt (8) into the open end of the post (2) and slide to the middle of the post. Screw the knob (8) onto the bolt until tight.

2. Using the three supplied screws (7) and a screwdriver, connect the post (2) to the mounting base (5) by inserting the post into the plastic part on the mounting base in which the connectors (6) are on.

3. Put the four rubber feet (9) on the bottom side of the mounting base (5) in the four corners.

4. Slide the EPM (1) opening onto the post (2) until it rests on the bolt and knob (8).

5. Snap the coil cord (4) connector into the bottom of the EPM

6. Determine the proper height of the foam spacer by setting one of the supplied foam spacers (3) on the top long side of the mounting base (5). The foam spacer on top of the base with feet should be approximately 1/8" higher than the gap opening on the bottom of the desired thermal transfer printer. Attach spacer when proper foam spacer is selected.

Installation

LED Functions
The LEDs indicate the status of the EPM. The following are what each LED's color correspond to:

        ⏻ **Amber -** The EPM is powered on
        ↻ **Red -**   The EPM is attempting to read/write a label
        ↱ **Green** -   The EPM has successfully read/wrote a label

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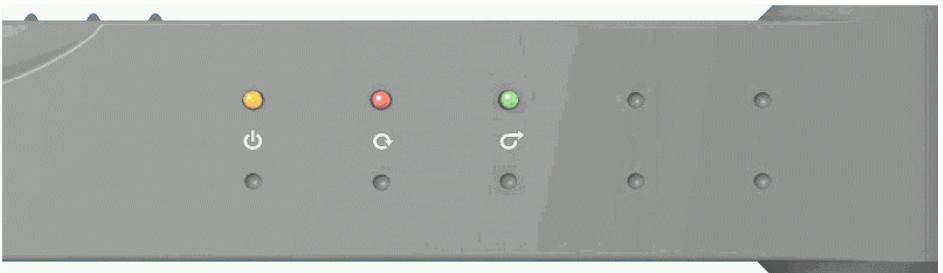
Power connection
Plug the 12Vdc into the wall outlet and the other end into the power connector on the backside of the plastic piece on the mounting base around the post. When properly connected the red LED should light.

Serial connection
Plug a end of the DB9 serial cable into the computer and the other end into the DB9 connector next to the power connector.

Verify Hardware Installation
To verify the hardware is working correctly, the host software on the CD-ROM will need to be installed. The software contains the necessary software for EPM enabled programs to interface with the EPM and it also contains a test program.

After the software is installed a RFID Smart Label should be placed on the thin lip of the EPM. The program 'Test EPM Connectivity' should be in the Programs menu under Brady. Run this program and click on the test button. The program will instruct the EPM to attempt to communicate with the RFID Smart Label.

When attempting to communicate, the red LED should light. If the RFID Smart Label is correctly placed (program indicates how to place for testing), the red LED should light followed by the green LED which indicates a successful label read.

The test program attempts to read the RFID Smart Label serial number and data. If the program is successful, the program will also visually indicate that information. If the red LED doesn't light, the EPM is not functioning correctly.

EPM Positioning Instructions

EPM Height Adjustment

The EPM height can be adjusted by untightening the adjustment knob on the back of the post. The height of the EPM should be such that when the EPM mounting base is seated under the printer to use, the EPM lip should be next to the exit path of the labels from the printer and approximately 1/8" below the plane of the labels. When printing labels, the labels should freely slide of the top of the EPM.

EPM Horizontal Adjustment

The EPM needs to be positioned correctly to work with RFID Smart Labels. A RFID Smart Label size standard doesn't exist at this time, so the optimum placement of various labels can not be specified exactly. It can be suggested though where the majority of the RFID Smart Label should be located after being printed on by a thermal transfer printer.
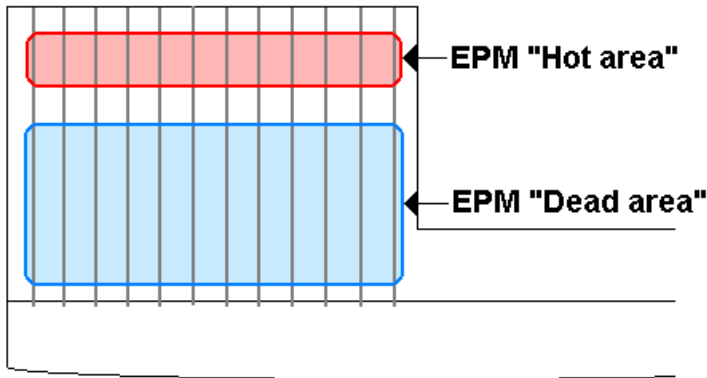

The EPM was intentionally designed to have a very wide and very narrow "Hot area" for encoding a RFID Smart Label. The width allows for a variety of label width while the narrowness allows for encoding of long and short labels without encoding adjacent labels. The current offering of Brady RFID Smart Label sizes can be found on the CD-ROM provided.

The EPM was also intentionally designed to have a very large "Dead area" next to the "Hot area". If a tag is completely within this area, the EPM should not be able to communicate with it. This additionally provides protection against encoding undesired labels adjacent to the desired label.

To optimize the location of the label after being printed, it is suggested to use non-RFID labels of the same size. This allows for proper positioning of a potential RFID Smart Labels and the design and presentation of the labels, without wasting the more costly RFID Smart labels.

After being printed, a large portion of the label should be positioned over the "Hot area". If it isn't, the positioning can be achieved by adjusting the back feed of the printer or by physically moving the EPM with respect to the printer. The following pictures show good and bads ways to have RFID smart labels positioned over the EPM.
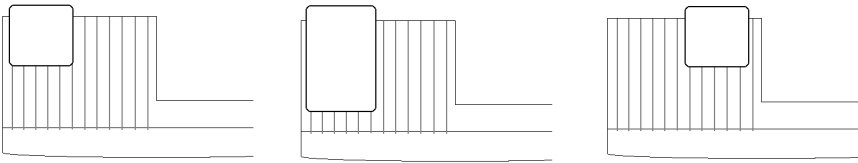
Good EPM/Label Positioning
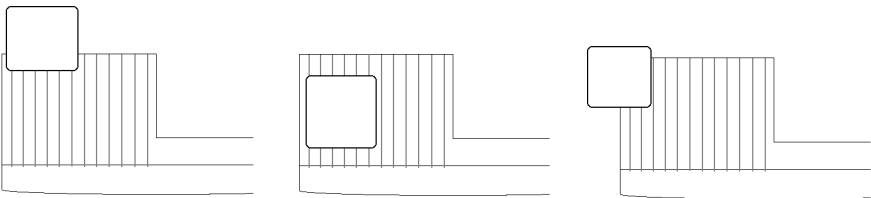
Bad EPM/Label Positioning

Once this alignment is achieved, the previously mentioned test program can be used to verify positioning and functionality for that specific location. Once the user is satisfied with functionality, the user should refer to the label creation documentation on how to enable the RFID Smart Label functionality of that package.

Note: Sometimes it is best to move the EPM a little in all directions during testing with test software and verifying the EPM wasn't physically located in an area the might occasionally not be encoded.

Operation

The operation of the EPM is covered in the label creation software manual. Further information not provided in that manual, can be found in this manual. As example is the functionality of the LEDs in the 'Installation' section.

Maintenance

There is no maintenance required by the EPM. If new rubber feet or foam spacers are needed, contact Brady for replacements.